F-45N / F-43N (306A)

Service Manual

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1． Machine Type

F-45N (PF20): Standard type

F-43N (PF21): The popular type machine from which functions as paper feed table lifting motor, paper eject roller moving motor, Memory 1, Memory 2, Memory 3 and paper length input are deleted.

JP: Machine with a function of automatically detecting 6 paper sizes: A3, A4, A5, B4, B5, B6.

US: Machine with a function of automatically detecting 3 paper sizes: Letter, Legal, and Leisure.

- PF20JP: Standard type machine with a function of A3 size paper detection intended for Japan and Europe

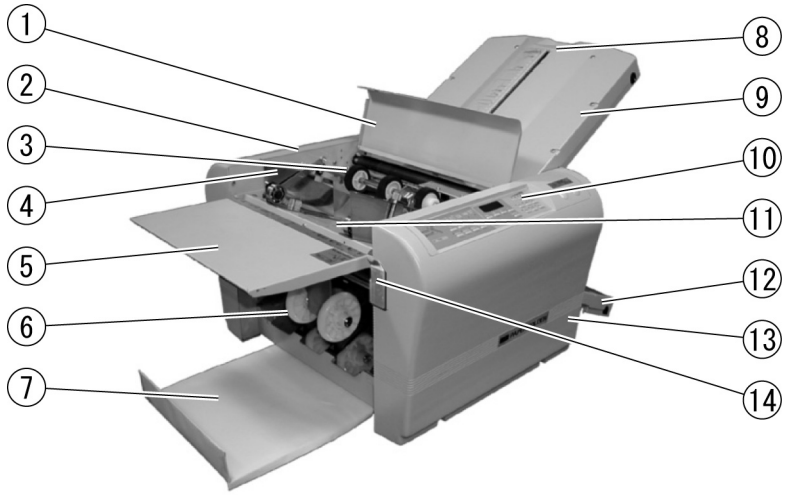
- PF20US: Standard type machine with a function of Letter size paper detection intended for the United States

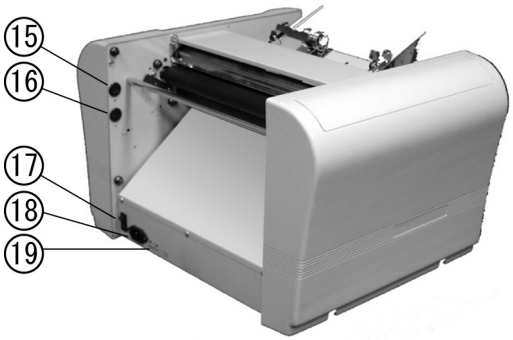
- PF21JP: Popular type machine with a function of A3 size paper detection intended for Japan and Europe

- PF21US: Popular type machine with a function of Letter size paper detection intended for the United States

How to discriminate each machine from the others from its appearance
If the operation panel of the machine has Memory 1, Memory 2, Memory 3 keys, the machine is F-45N and if not, it is F-43N.
If the paper feed auxiliary table has a 5mm square sensor, the machine is for the US and if not, it is for Japan and Europe.

2.Parts Names

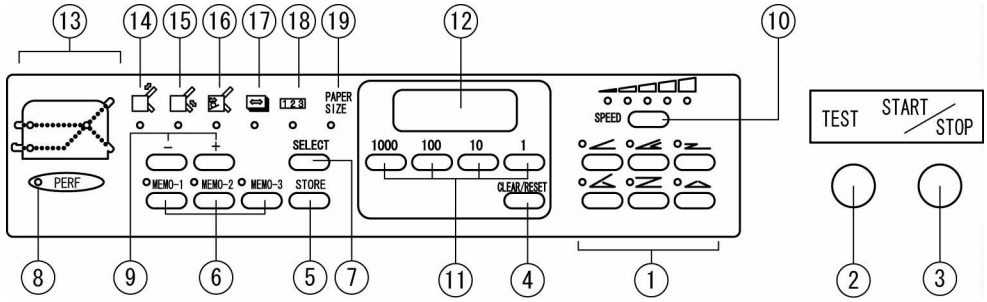




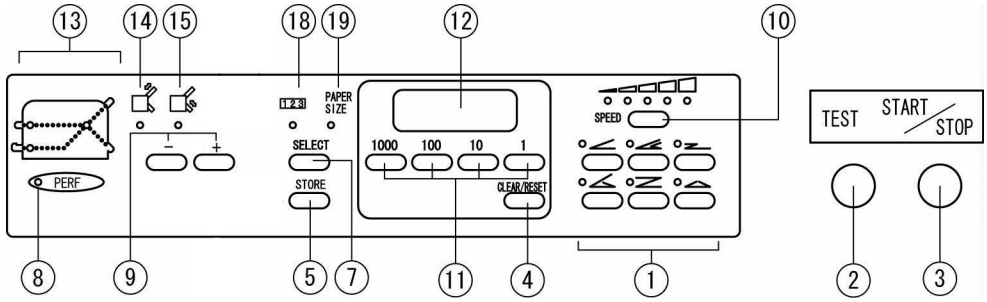
Number	Name	Number	Name
①	Roller cover	⑪	Paper feed table
②	Left side cover	⑫	Table 2
③	Paper feed roller	⑬	Right side cover
④	Paper guide	⑭	Paper feed table lever (F-43N only)
⑤	Auxiliary table	⑮	Table 1 socket
⑥	Paper eject roller	⑯	Table 2 socket
⑦	Paper eject table	⑰	Power source switch
⑧	Stopper fine adjustment knob	⑱	Inlet
⑨	Table 1	⑲	Circuit breaker
⑩	Control panel		

3.Designation and Functions of Operation Panel

F-45N



F-43N



No.	Designation/Indication	Function
①	Fold type key	Six folding types can be input and stored.
②	Test key	Test folding of two sheets is performed.
③	Start/Stop key	Operation starts and if pushed again, the machine stops.
④	Clear/Reset key	Clearing the indication of the counter / resetting an error.
⑤	Store key	Fold position after adjustment is stored.
⑥	Memory 1/2/3 key	Three special folding types are stored. (only for F-45N)
⑦	Select key	Used for selecting the indication of the counter, the position of the stopper stud of Table 1 and 2, the position of eject roller, paper length.
⑧	Perforation mode lamp	It is on when the optional sewing unit is installed.
⑨	+/- key	Used for adjusting the position of the stopper of Table 1 and 2, the position of eject roller, paper length.
⑩	Speed adjust key	Used for adjusting the speed.
⑪	Numerical key	Used for inputting the reduced number and the length of non-standard-size paper.
⑫	Counter	The number of sheets, the position of the stopper pin of Table 1 and 2, paper size are indicated.
⑬	Check lamp	It is on when paper stock runs short, or indicates a place where paper feed trouble occurs.
⑭	Table 1 stopper move mode lamp	It is on when the position of stopper of Table 1 is adjusted.
⑮	Table 2 stopper move mode lamp	It is on when the position of stopper of Table 1 is adjusted.
⑯	Paper eject roller move lamp	It is on when the position of the eject roller is adjusted. (only for F-45N)
⑰	Paper length input mode lamp	It is on when paper length is input (only for F-45N)
⑱	Counter input mode lamp	It is on when reduction is indicated on the counter.
⑲	Paper size paper size input mode lamp	It is on when paper size is indicated.

4.Cautions for Maintenance

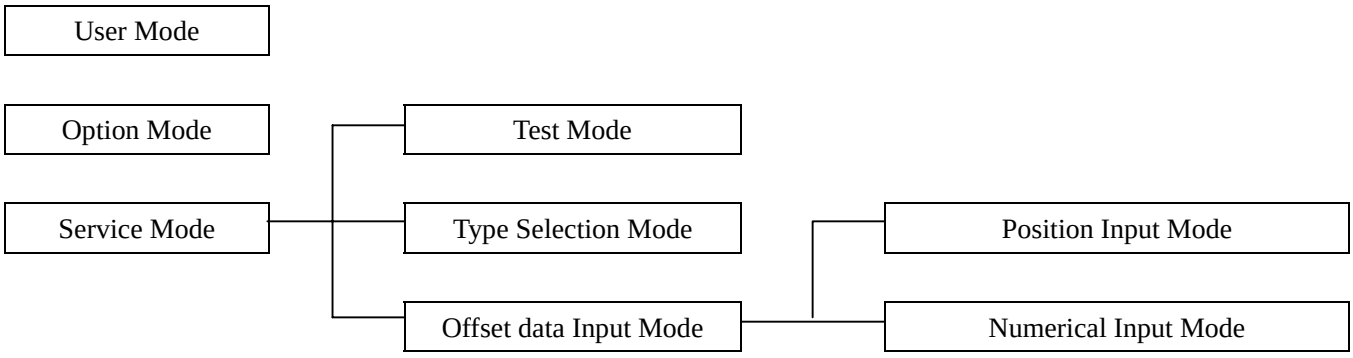
(1) Be sure to turn off the power source switch before performing maintenance work. Start maintenance work after pulling the power source cord from the electric outlet.

(2) This machine has several photo sensors. Be sure to clean the photo sensors when inspecting the machine.

(3) Thin wires are used for wiring between the boards. Be sure to pull out put in connectors while holding their socket. Be careful not to stretch the wires too tightly and also be careful to prevent slackened wires from touching the moving elements of the machine. Be sure to insert connectors into sockets as far as they go when setting them.

(4) Because the rollers of this machine are easily covered with paper dust, be sure to clean these rollers when inspecting the machine.

5. Operating Conditions



User Mode:

Mode to be applied during normal use

Turn the power on without pressing any operational key

Option Mode:

Mode to be applied when users utilize the perforation unit

Turn the power on while pressing the Select key

Service Mode:

Mode to be applied when service man or manufacturer makes adjustment

Turn the power on while pressing any specific key

Service Mode is the generic name for Test Mode, Type Select Mode and Offset Data Input Mode

Test Mode:

Buzzer and motor can be turned on or off at user disposal

Type Select Mode:

Mode to be applied when making the control substrate recognizes the machine type. This is necessary when the control substrate is replaced.

Offset Data Input Mode:

Mode to be applied when storing mechanical difference in the control substrate as an offset data.

Offset Data Input Mode is the generic name for Position Input Mode and Numerical Value Mode

Position Input Mode

Make adjustment using Stopper Fine Adjustment Knob

Numerical Input Mode

Make adjustment using + key and - Key.

6.Explanation of How to Operate the Machine

(1) Turn on the power source switch.

[1] ROM version is indicated first, then the model code number, destination code number and the paper size are indicated one after another.

[2] The table 1 and 2 stoppers will move to the original position on the roller side.

(2) Set sheets of paper.

Press the Fold Type key desired.

(3) Press the Test key.

[1] The table 1 and 2 stoppers will move to the fold position.

[2] The machine will fold two sheets of paper according to volume speed and then stop operation.

(4) Press the Start key.

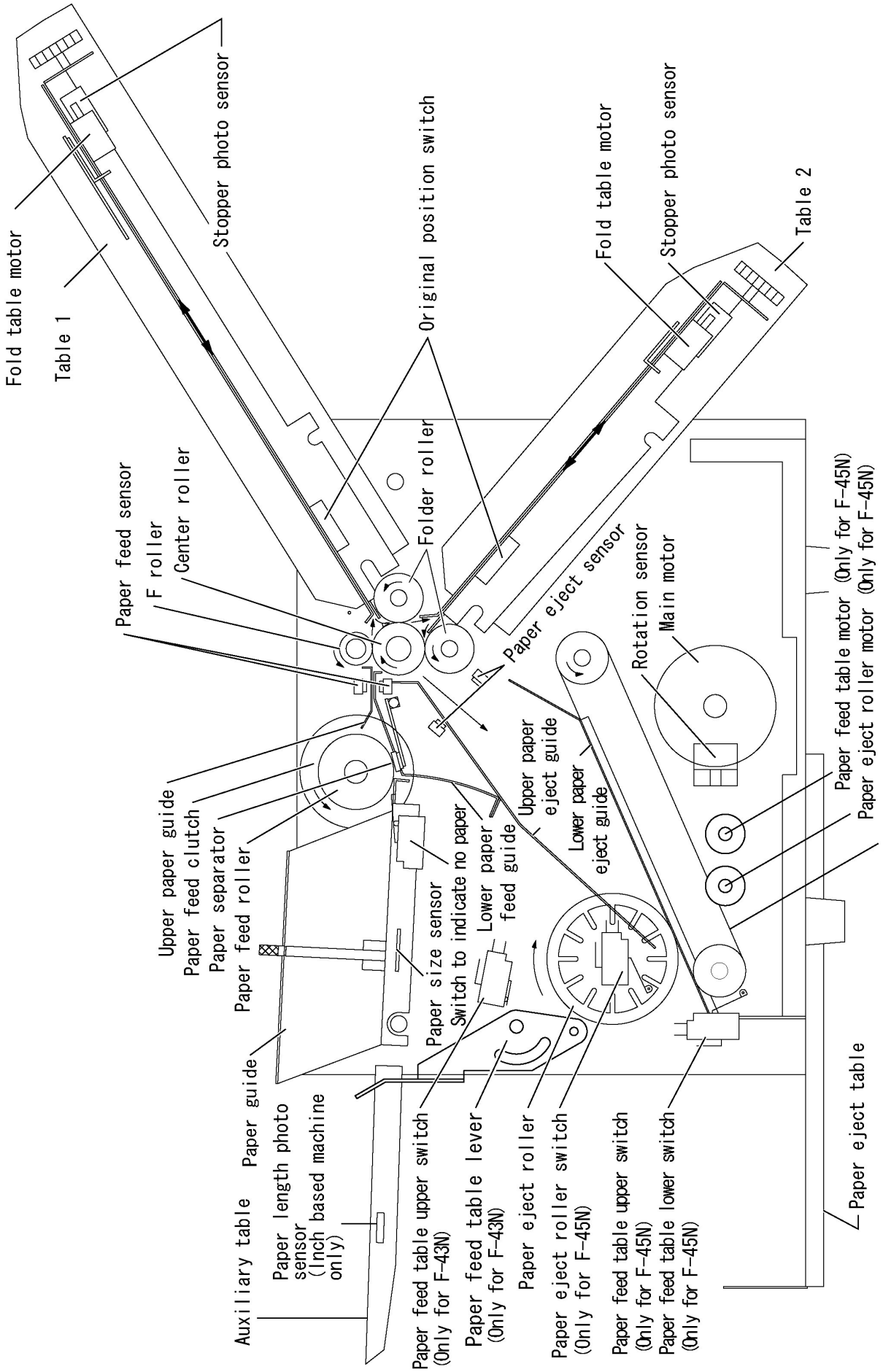
[1] In the case of subtraction, if the Start key is pressed after inputting the number of sheets of paper to be folded using the numerical keys , the figure on the counter will decrease by one every time a sheet of paper is folded, the alarm will sound signaling the completion of folding and the machine will stop operation.

[2] In the case of addition, the machine will start when the Start key is pressed and will stop operation when the Stop key is pressed.

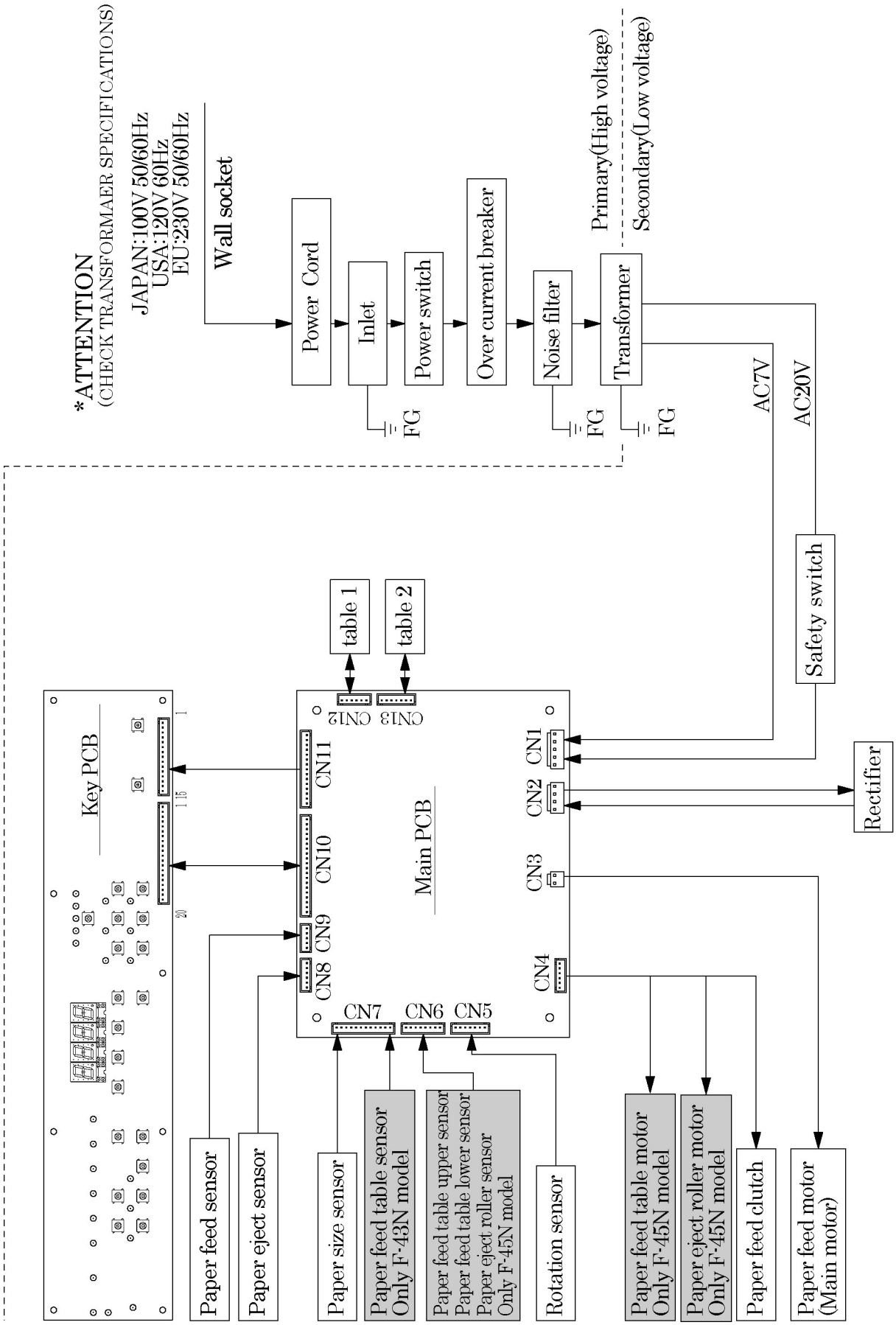
[3] If there is no paper, the alarm will sound and at the same time, the machine will stop operation.

[4] When paper being fed slips or there is a paper jam, the alarm will sound with an error number displayed and the machine will stop operation.

7. General Arrangement Plan



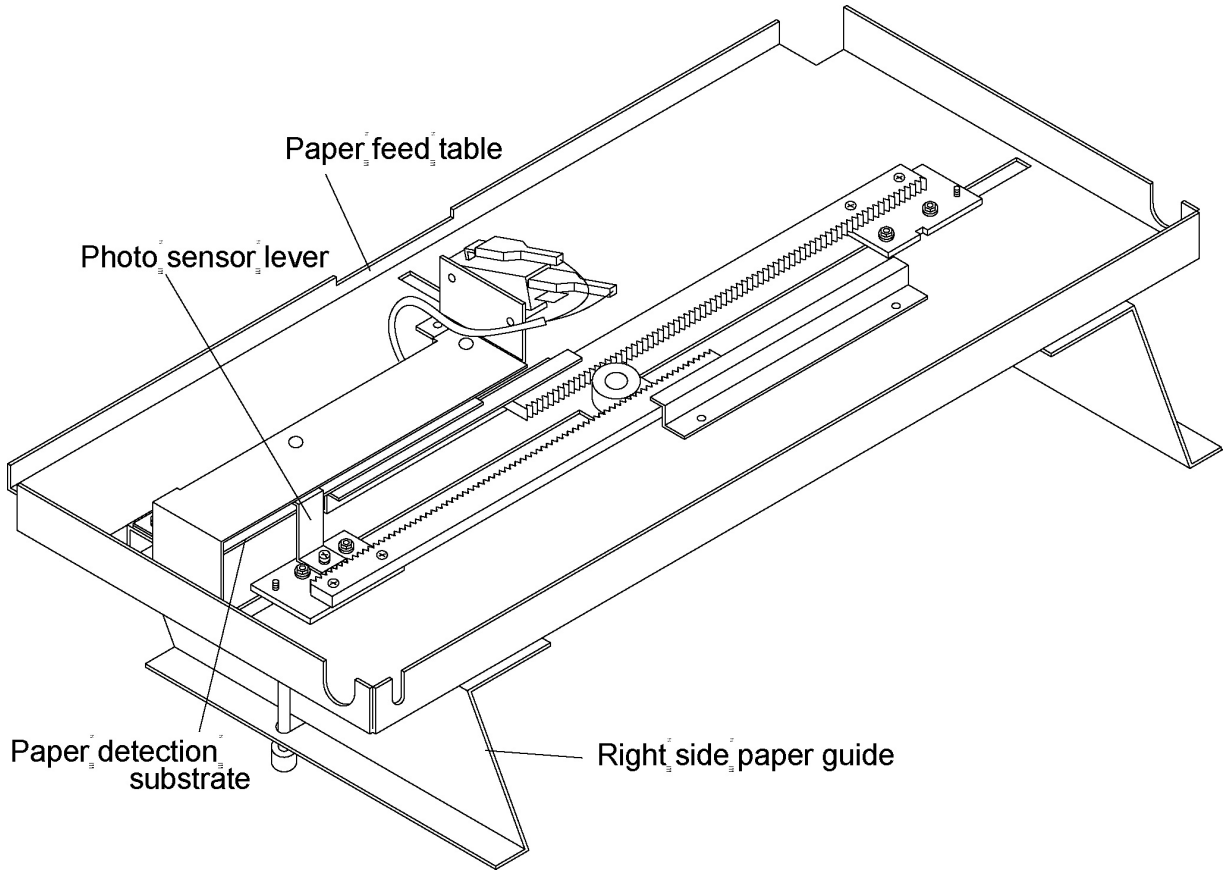
8.Essential Wiring Diagram



9. Paper Feed Table Section

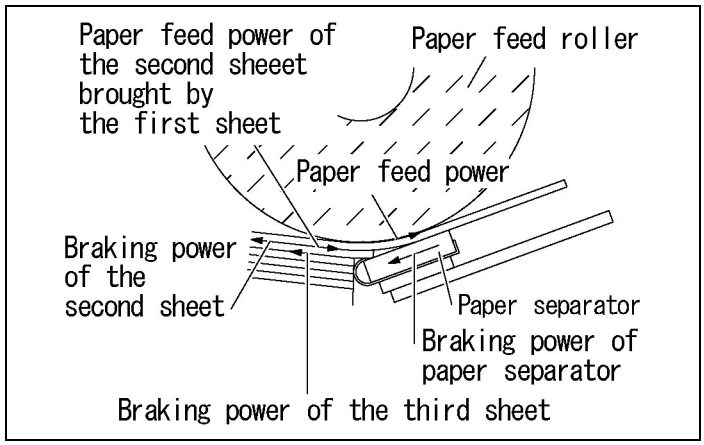
As the paper feed table is raised, paper feed pressure is given to the paper feed roller.

Paper guides slide symmetrically to both sides and the photo sensor lever on the right side paper guide detects the paper width.



10. Paper Feed Section

As the paper feed table is raised, paper feed pressure is given to the paper feed roller which contacts the paper put on the paper feed table, and on the opposite direction to the paper feed roller feeding direction, the paper separator separates


Paper feed power of the second sheeet brought by the first sheet
Paper feed roller
Paper feed power
Braking power of the second sheet
Paper separator
Braking power of paper separator
Braking power of the third sheet

One sheet after another. The first sheet

Paper feed power > braking power of the second sheet + braking power of the paper separator - makes it possible to feed paper

The second sheet

Paper feed power of the second sheet> braking power of the third sheet + braking power of the paper separator - makes it impossible to feed paper

11. Paper Fold Section

(1) Structure

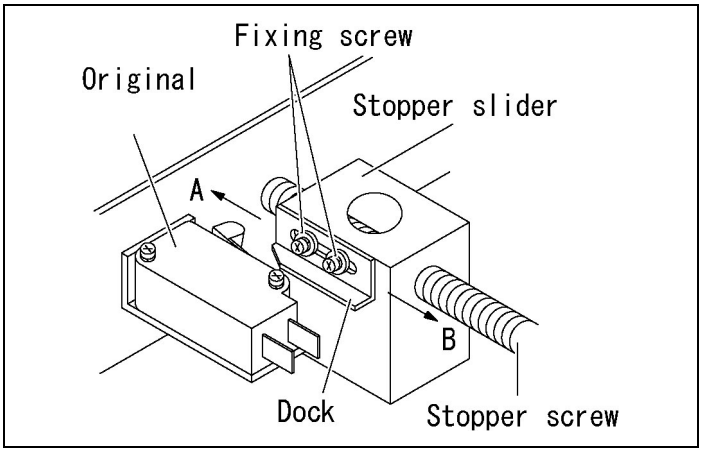
The stopper slider which movers horizontally and the stopper plate is installed at the stopper screw set in the center of the table. The stopper plate is moved horizontally by turning the stopper screw using the micro motor power via reduction

gear, and making the photo sensor read the rotation speed and its direction. Table 1 and 2 have the original position identifying switch and the position is determined by the doc.

(2) Adjustment

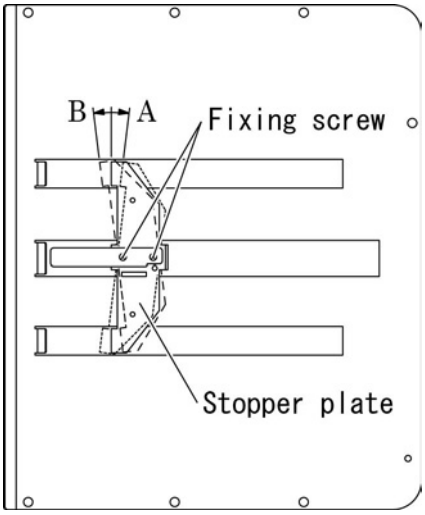
Adjustment for the original position

[1] Remove the table and detach the resin cover.
[2] Move the doc of the stopper slider until the switch is turned on.(Check the switch terminal with the Tester)
[3] Put a mark of the position of the doc on the stopper slider and confirm the present position.
[4] Loosen the fixing screw and move the dock. When the dock is moved in the direction A, the length of the folded part of the paper is longer by the length moved. When the dock is moved in the direction of B, the length of the folded paper is shorter by the length moved.



(3) Feed Angle Adjustment

[1] Set the slant adjustment knob of the paper feed table in the center.
[2] Set the A4 size paper of 55kg/m2 which is cut at right angles on each corner.
[3] Set Table 1
[4] Remove the Table 2 and after setting the stopper plate of Table 1 at about 140 on the scale, and start folding.
[5] If the sheet is folded as shown in Figure 1, remove the resin cover of the folding table and loosen the fixing screw of the stopper plate and bend the plate in the direction of A.
[6] Set the Table 2.
[7] If the sheet is folded as shown in Figure 2, remove the resin cover of the folding table and loosen the fixing screw of the stopper plate and bend the plate in the direction of B.



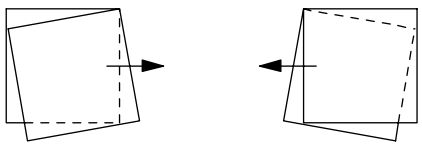
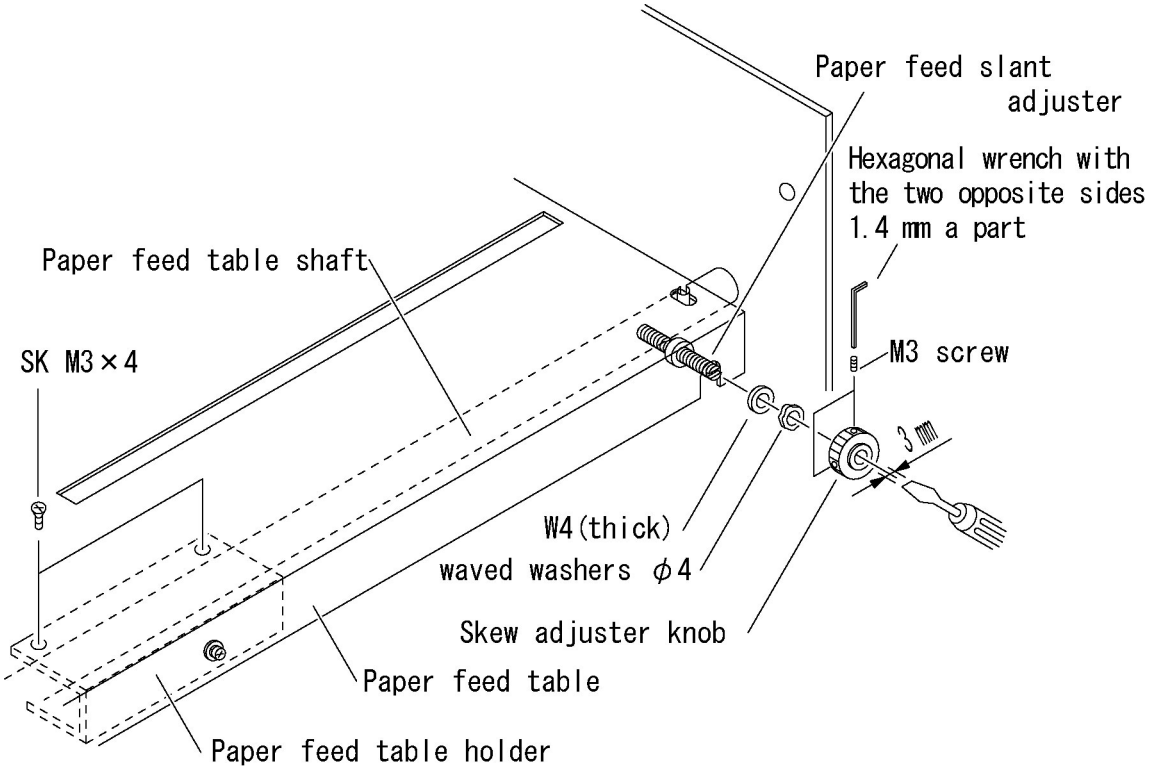


Figure 1 Figure 2

12.Attachment and Adjustment of Slant Adjuster Knob



(1) Attachment

[1] Drive the paper feed slant adjuster into the M4 screw section of the paper feed table shaft as far as it goes by turning the adjuster clockwise.

[2] Place the paper feed table on the paper feed table holder and fix the table to the holder using an SK M3x4-2 screw. At this time, be careful to ensure that the wire is not caught between the table and holder.

[3] Fit a W4(thick) washer and the waved washers to the screw section of the paper feed slant adjuster and then fix the slant adjuster knob to the adjuster.

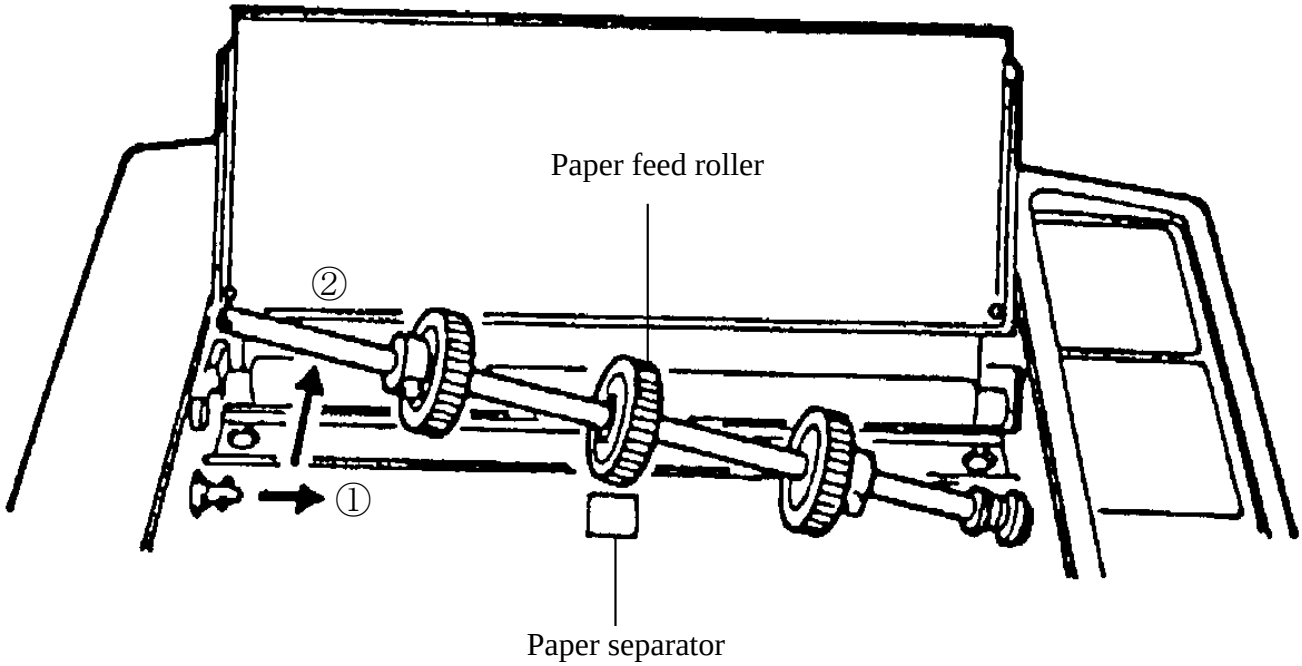
(2) Adjustment

[1] Turn the paper feed slant adjuster clockwise as it goes.

[2] Turn the slant adjuster knob clockwise further to the extent that the waved washers are permanently disfigured. Then, put a minus driver into the groove section of the adjuster (hold the adjuster so that it will not revolve in the reverse direction) and fasten the slant adjuster knob using two M3 screws after turning the knob counterclockwise in a 180-degree to 360-degree ark.

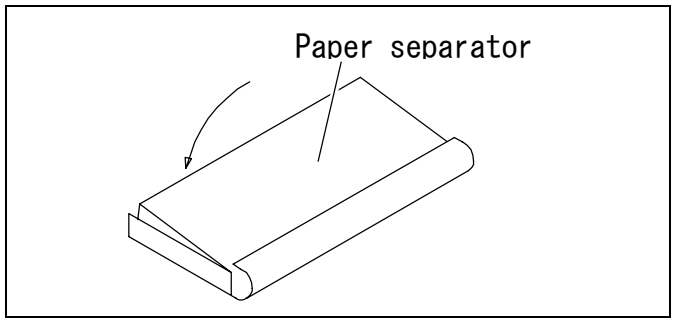
※After the fastening, ensure that the slant adjuster knob can be lightly rotated. Also, be careful so that the screws will not become lose.

13.Replacement of Paper Feed Roller and Separator



Removal of the paper separator

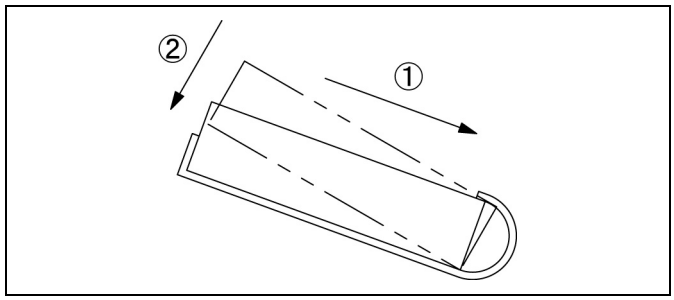
Hook your fingernail at the back edge of the paper separator to take out the paper separator.



Attachment of the paper separator

[1] Push the front edge f the paper separator against the R section.

[2] Insert the back edge of the paper separator.



Remove the paper feed roller in the order of ① to ② shown in the figure. Attach the roller in the reverse order.

Replace the separator as indicated in the figure above.

When the paper feed roller and/or the paper separator are replaced with a new one, ensure that these order.

Attach the paper separator to the machine with its smooth surface up.

14. When the control substrate is replaced

When the control substrate is replaced, the machine type data and the offset data will be changed. So, adjustments such as machine type selection, deletion of storage, interceptor adjustment, offset adjustment of the fold table 1, offset adjustment of the fold table 2 must be made.
These can only be done with the Service Mode only.

Apply the Machine Type Select Mode:
(1) Press Single Fold key and Double Fold key.
(2) Turn the power on.
(3) SP-1 is indicated and the alarm sounds. Then, the Machine Type Select Mode is set.
(4) Release Single Fold key and Double Fold key.
(5) When +1 key is pressed, PF20JP Mode is set and the machine restarts.
(6) When +10 key is pressed, PF20US Mode is set and the machine restarts.
(7) When +100 key is pressed, PF21JP Mode is set and the machine restarts.
(8) When +1000 key is pressed, PF21US Mode is set and the machine restarts.
(9) When Clear is pressed, nothing is set and the machine restarts.
(10) The User Mode is applied.

Offset Data Input Mode is applied:
(1) Press Zigzag Fold key and Letter Fold key.
(2) Turn the power on.
(3) SP-2 is indicated and an alarms sounds.
(4) Release the Zigzag Fold key and Letter Fold key.
(5) The Offset Data Input Mode is applied.
(6) Press Start key when returning to the User Mode.

Deletion of stored data:
(1) Keep pressing the Clear key and release it when an alarm sounds three times.

15. Position Input Mode

Store the position of the interceptor (Position input mode):

(1) Lightly turn the fine adjustment knob until it is locked. Then, return it in one complete circle.

(2) Press the Store key, the Select key and the Single Fold key simultaneously.

(3) After the existing position is indicated, the new position will be indicated.

Store the offset quantity of the folding table 2 (Position input mode)

(1) Perform single fold based on test fold using the paper with dimension precision indicated.

(2) Make adjustment using the fine adjustment knob of the fold table 2.

(3) Press the Store key, the Select key and the Parallel Fold-out Fold key simultaneously.

(4) After the existing position is indicated, the new position will be indicated.

Store the offset volume of the folding table 1 (Position input mode)

(1) Perform double fold based on test fold using the paper with dimension precision indicated.

(2) Make adjustment using the fine adjustment knob of the fold table 1.

(3) Press the Store key, the Select key and the Double Fold key simultaneously.

(4) After the existing position is indicated, the new position will be indicated

16. Numerical Value Input Mode

Store the position of the interceptor (Position input mode):

(1) Press the Store key, the Select key and the Letter Fold key simultaneously.

(2) The existing stored value will be indicated.

(3) Increase or reduce the value using + key and - key. 1 step = 0.0625mm

(4) Store the value pressing the Store key or leave as it is pressing the Clear key.

Adjust the offset on the Fold table 1 (Numerical input mode)

(1) Press the Store key, the Select key and the Zigzag Fold key simultaneously.

(2) The existing stored value will be indicated

(3) Increase or reduce the value using + key and - key. 1 step = 0.0625mm

(4) Store the value pressing the Store key or leave as it is pressing the Clear key.

Adjust the offset on the Fold table 2 (Numerical input mode)

(1) Press the Store key, the Select key and the Gate Fold key simultaneously.

(2) The existing stored value will be indicated.

(3) Increase or reduce the value using + key and - key. 1 step = 0.0625mm

(4) Store the value pressing the Store key or leave as it is pressing the Clear key.

17. Test Mode

(1) Press the Test key.

(2) Turn the power on.

(3) Test Mode is set.

(4) Press any specific operational key. Refer to the following list of operational keys and their functions.

(5) In order to return to the User Mode, press the Start key.

List of Keys:

No	Name of operational key	Function
1	Parallel Fold-out	Fold Turn on or off All LED
2	Gate Fold	Turn on or off the buzzer
3	+1000	Indicate the status of the fold table photo encoder
4	+100	Indicate the status of the fold table original switch and the tacho photo encoder
5	+10	Indicate the status of the paper eject roller switch and the paper feed R/L switch.
6	+1	Indicate the status of the paper detect substrate.
7	Selection	Select the fold table stopper 1 and 2.
8	+	Move the fold table stopper (+)
9	-	Move the fold table stopper (-)
10	Double Fold	Turn on or off the paper feed motor
11	Speed	Adjust the speed of paper feed motor
12	Zigzag Fold	Indicate the rotating speed of the center roller.
13	Single Fold	Turn on or off the paper feed solenoid
14	Memory 1	Lift the paper feed table (only for F-45N)
15	Memory 2	Move the paper feed roller 1,2,3 (only for F-45N)
16	Start	Return to the User Mode17Letter Fold* Prohibited to use

18. Trouble Guide

Trouble	Possible Cause	Measures
The power is not obtained even if the power switch is turned on.	The cord is unplugged.	Put the cord firmly into the outlet.
	The breaker is applied.	Press the Breaker button.
	Poor contact of the power switch.	Replace the power switch.
	Poor contact in the noise filter.	Insert it firmly.
	Poor contact of the control substrate CN1	Insert it firmly.
	Malfunction of the transformer.	Replace the transformer.
	Malfunction of the rectifier	Replace the rectifier.
	Malfunction of the control substrate	Replace the control substrate.
The stopper plate does not move.	The socket of Table 1 or 2 is undone.	Insert the socket firmly.
	Paper jam inside the Table 1 or 2.	Remove the table and take the paper out.
	Contact failure of the control substrate CN12.	Insert it firmly.
	Contact failure of the control substrate CN13	Insert it firmly.
	The stopper photo sensor is stained.	Clean the stopper photo sensor.
	The motor of hold table motor is stiff.	Adjustment of gear.
	Malfunction of the fold table motor.	Replace the fold table monitor.
	Malfunction of the control substrate	Replace the control substrate.
The paper detection switch of the paper feed table does not work.	The table lever is not raised (only for F-43N)	Raise the table lever.
	Contact failure of the paper detection switch.	Insert it firmly.
	Contact failure of the DIN connector.	Insert it firmly.
	Contact failure of the control substrate CN6.	Insert it firmly.
	Inferior control substrate	Replace the control substrate.
Paper eject jam frequently occurs.	The position of the paper eject roller is not set at the position suitable for the paper size.	Adjust the position of the paper eject roller at the suitable position.
	Full of ejected papers.	Remove the paper.
Paper cannot be fed while paper is ejected.	The paper eject sensor is stained.	Clean the paper photo sensor.
	Contact failure of the control substrate CN8.	Insert it firmly.
	Inferior control substrate	Replace the control substrate.
The paper size cannot be detected.	Contact failure of the DIN connector.	Insert it firmly.
	Contact failure of the control substrate CN7.	Insert it firmly.

Trouble	Possible Cause	Measures
Wrinkles appear on the paper.	The paper is coiled around the roller.	Remove the table and get rid of the paper around the roller.
	Stains on the roller.	Clean the roller.
	Ruled paper or paper with little stiffness is used.	Slow down the processing speed.
	The paper other than the designated is used.	Use any designated paper.
Paper feed slip frequently occurs.	The paper feed roller is worn out.	Replace the paper feed roller.
	Stains such as paper chips and ink left on the paper feed roller.	Clean the paper feed roller.
	Other paper than the specified is used.	Use any specified paper.
	The brake rubber is stained.	Clean the brake rubber.
Feeding of stuck paper frequently occurs.	The brake rubber is worn out.	Replace the brake rubber.
	The brake rubber is stained.	Clean the brake rubber.
	The sheets of printed paper stick.	Reset the paper after loosening it sufficiently.
	Other paper than the specified is used.	Use any specified paper.
Slant fold occurs.	Fine adjustment is not made.	Adjust slant fold using the fine adjustment knob.
	Processing speed has been changed halfway.	Fix the speed.
	The roller is stained.	Clean the roller.
	The auxiliary paper guide is set in a bending condition or is not in close contact with the paper.	Keep the auxiliary paper guide in close contact with the paper.
	The paper feed table is bent.	Straight the paper feed table using the slant adjustment knob.
	The paper is cut out in a bending condition.	Make adjustment using the slant adjustment knob.
Paper jam frequently occurs.	A piece of paper is stuck at a part where the paper passes by.	Check where is the part is and remove the piece.
	The roller is stained.	Clean the roller.
	Abnormal occurrence of static electricity	Spray the static electricity remover sold at stored.
Crimped paper is fed.	Curl of the paper is too big.	Correct the curl.
	Fine adjustment is not set properly.	Make proper fine adjustment.
	The table is not set properly.	Reset the table properly.
The paper is not fed even after the Start key is pressed.	The paper is not set on the paper feed table, or the table is lowered.	Put the paper on the paper feed table and raise the table.
	Contact failure of the control substrate CN6	Insert it firmly.
	Malfunction of the control substrate	Replace the control substrate.
	Malfunction of the operational substrate	Replace the operational substrate.